

SIPHONAPTERA COLLECTED BY DR. GERD HEINRICH IN
BURMA.

By KARL JORDAN.

(With 13 text-figures.)

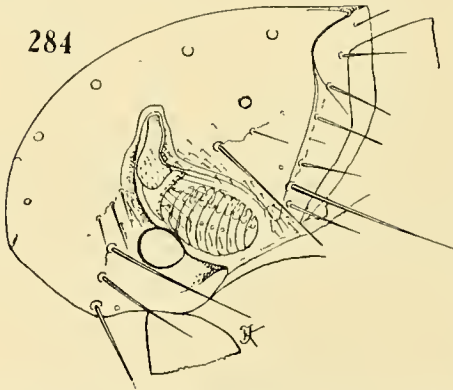
AS we had hardly any specimens of fleas from Burma the collection made by Dr. Heinrich was most welcome, and I express here my gratitude to him and his companions to have taken the great trouble of preserving the external parasites found on the mammals obtained. The majority were collected on Mt. Victoria in the Pakokku Chin Hills, a range to the west of the Irawadi R.; others were found farther south in western Burma on Mt. Popa and some other places in the Prome district; and a small but interesting portion of the material was obtained in north-eastern Burma near Mandalay and Maymyo. Ten species altogether are represented in the collection, of which three species and a subspecies are new to science and nearly all the others new for Burma.

1. *Ctenocephalides felis orientis* Jord. 1925.

20 km. north of Mesktila, on *Felis chaus*, 20.i.38, 1 ♂, 1 ♀; Maymyo, 800 m., 6.xii.37, on *Paradoxurus paradoxus*, 1 ♀.

2. *Paraceras hamatus* sp. nov. (text-figs. 284-286).

Close to *P. melinus* Jord. 1925, belonging like that species to the tropical group of the genus, which differs from the palearctic group in the proboscis reaching at most to the apex of the trochanter, in the longer spines of the pronotal comb and the longer stylet of the ♀.

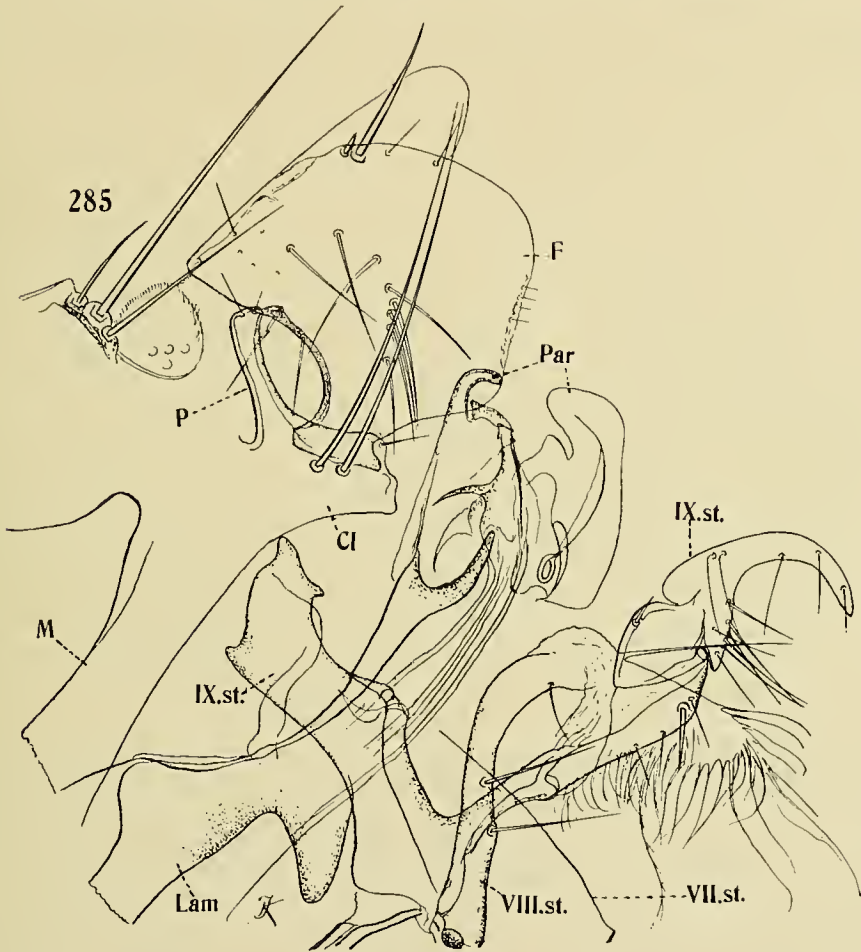


♂♀. On frons a row of three long eye-bristles, which are larger in ♂ than in ♀; farther forward and upward a second row of smaller bristles, 7 in ♂ and 2 or 3 in ♀, the lowest bristle of this row slightly above the level of the upper eye-bristle, the row not being continued to the oral margin (text-fig. 284, ♀). On occiput, in ♂, a

single antemedian bristle about the size of the second bristle (from above) placed at the anterior margin of the antennal groove; in middle an oblique row of 3, of which the lowest is large, the second about the size of the subdorsal one of the posterior row, and the third about half the size; the posterior row consists of 5 bristles each side, the lowest being very large, the others as usual much smaller, interspace between first and second much smaller than between second and third. In ♀ the anterior occipital bristle absent; the median row consists of 2 bristles, of which the second is small; posterior row

as in ♂, but the bristles smaller, and there is an additional longish bristle below the large one. Proboscis reaching to apex of trochanter or nearly.

Dorsal spines of pronotal comb longer than the pronotum, the spines measured from the anterior margin of the dark vertical band placed at the base of the spines. Bristles on the two sides together : on pronotum 11 to 14, usually 12; mesonotum 40 odd small ones in a row and scattered over the dorsal and basal surface, a posterior row of 10 to 12, usually 10; metanotum 13 to 22, 11 to 14; spines on underside of mesonotum 9 to 12. Bristles on mesopleura



8 to 10; on metepimerum 8 to 10, usually 4, 4, 1. Short apical spines (on the two sides together): metanotum 2 to 4; abdominal tergum I 2, II 2 to 4, usually 3, III 2 or 3, usually 2, IV 2, V 1 to 3, usually 2 in ♂ and 1 in ♀, VI 0 or 1, usually 0. Bristles on abdominal terga: on I in ♂ 11 to 13, 10 or 11, in ♀ 13 to 19, 9 or 10; II ♂ 11 to 13, 14 to 16, ♀ 12 to 14, 13 or 14; III ♂ 10 to 12, 15, ♀ 12, 14; IV ♂ 9 to 12, 14 or 15, ♀ 11 to 13, 13 or 14; VII ♂ 8 or 9, 12 to 15, ♀ 7 to 9, 10 or 11. On sterna III to VI in ♂ 6, rarely 7 on one segment, in ♀ 6 to 8, usually 8. Lower antepygidial bristle of ♂ more than half the length of the middle one.

In hindtarsus of ♂ two slender apical bristles at posterior side of segment II reach much beyond III, a slender bristle in subapical notch of posterior side

does not quite extend to middle of III; on posterior side of III two slender apical bristles reach about to middle of V. Measurements: midtarsus ♂ 16 to 18, 22, 14 to 16, 8 or 9, 20 or 21; ♀ 17, 22 to 24, 14 to 16, 8 to 10, 20 to 22; hindtarsus ♂ 56 to 66, 32 to 36, 18 or 19, 11 or 12, 22; ♀ 57 to 63, 30 to 36, 18 to 21, 11 or 12, 23 to 25. The difference in length between segments I and II of the midtarsus is noteworthy.

Modified Segments.—♂. On tergum VIII 16 or 17 long bristles, most of them in the dorso-marginal area; on inside a spiculose area from anterior dorsal angle to near the last marginal bristle, the area being nearly six times as long as broad, the spicules dense at the boundary away from the margin, the boundary being partly marked by an incrassate stripe and on outer side by a row of long bristles. Sternum VIII (text-fig. 285) of the usual shape, of nearly even width, directed obliquely upwards and apically curved distad, bearing a large membranous flap slit into numerous filaments (diagrammatically indicated in the figure); at the ventral margin two longish bristles as in figure, or the lower bristle accompanied by an additional longish one, or two bristles close together and the third absent; near apex a very thin ventral bristle. Process P of clasper touches the anterior margin of the digitoid F at approximately two-thirds; digitoid F about as broad as long, distally strongly rounded, in outer half of ventral margin a row of minute bristles; at upper end of distal margin a strong bristle, below it some small slender ones and close to and above it a small one, which is either short and rather stout or much thinner than in figure; on inner surface the usual row of bristles, here 7 or 8. Apex of vertical arm of sternum IX with three projections, two posterior and one anterior; the most characteristic feature of the ventral arm is the apical division, which is gradually curved down like a claw, the pair of claws of the two sides being very conspicuous; the nearest approach to this modification of the distal section of IX.st. we find in *P. crispus* Jord. & Roths. 1911. Phallosome of the same type as in other species of the genus, the ventral paramere being broad in the new species.

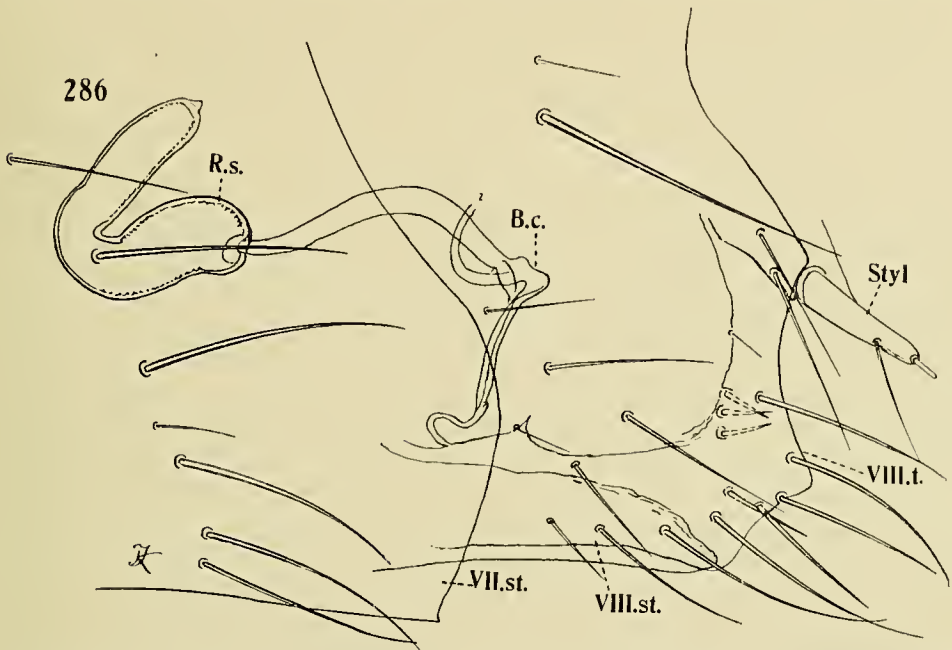
♀. Ventral portion of apical margin of sternum VII (text-fig. 286) rounded; this part is only a small portion of the margin, the greater part of which is strongly slanting. Tergum VIII in all 8 ♀♀ with a long and a short bristle below the stigma; on outer surface of widened area altogether 12 bristles, some of which small; on inner side two bristles below apical angle and two or three short stout ones on the side; apical margin incurved twice, the angle in between 90°. Stylet and spermatheca as in the other tropical species; the small projection at the end of the tail of the spermatheca is not always so distinct as in the figure.

Length: ♂ 2.9–3.3, ♀ 3.8–4.4 mm.; hindfemur ♂ 0.59–0.69, ♀ 0.64–0.67 mm.

Mt. Victoria, Pakokku Chin Hills, 2200 m., on *Ratufa gigantea*, 21.vi.38, 2 ♂♂, 6 ♀♀, type ♂; also on *Martes*, 2.v.38, 1 ♂, 2 ♀♀.

When I noticed in Dr. Heinrich's material a species of *Paraceras*, I had great hopes that it would turn out to be *P. melinus* Jord. 1925; I am sorry the type of *P. melinus*, a ♀, does not agree with the series of Heinrich's 8 ♀♀. When I received the specimen from Oldfield Thomas, who had forgotten locality and host, it seemed to be worth while to describe it in spite of the absence of data, because it deviated much from the species known to me in the shorter proboscis and the long stylet. The specimen is in rather poor condition, but

nevertheless presents clearly the following differences from the new Burmese *Paraceras*. In front of the 3 large eye-bristles a row of 5 bristles from the antennal groove to near the oral margin, the second from above long; on occiput a median row of 3 as in ♂ of the new species and on one side also an antemedian bristle; posterior row of 6 each side with the second bristle much farther removed from the long one and the bristle below the large one much smaller (judging from the smallness of the pit, the bristle broken away on both sides). Sternum VII apparently not different; I said of *P. melinus* in Nov. Zool. xxxviii, p. 267 (1932), under *P. pendleburyi*, that "the ventral lobe of VII.st. is obtuse, rounded-emarginate." This is true of the left side, but the margin of the segment is slightly folded over as I now see; on the right side the margin is rounded as



in fig. 286; the row of bristles nearer the margin, distance of ventral bristle from apical ventral angle only half as long as in the new species. Above stigma of tergum VIII 10 bristles on the two sides together, in the new species 7 or 8; below the stigma one small and two large bristles, not counting the small one immediately below stigma; apical margin of widened area more rounded, the apical angle less projecting. The specimen somewhat larger than our largest ♀ of the new species, the tarsi, therefore, longer; measurements: midtarsus 28, 30, 17, 11, 26; hindtarsus 67, 40, 22, 13, 27. It will be noticed on comparison with the measurements of the new species that midtarsal I is much longer, being but slightly shorter than II and a little longer (not shorter) than V. These differences convince me that *P. melinus* is specifically distinct.

Macrostylophora.

The genus was "split off from the *fimbriatus* group (formerly of *Ceratophyllus*) on account of the process of the seventh tergite and the peculiar claspers" (Ewing, *A Manual of External Parasites*, London, 1929, p. 203). As the species allied to *fimbriatus* are not kept generically separate

from *Macrostylophora* in the present paper, an explanation is necessary. The species in question are essentially Oriental squirrel fleas and closely related to one another. Two of them have in the ♂ a long process in between the antepygidial bristles (*M. hastatus* and *M. pilatus* J. & R. 1921) and a peculiar knife-like spiniform at the upper posterior angle of the digitoid (text-fig. 287); in a third (*M. borneensis* Jord. 1926) the antepygidial process is quite short, not projecting beyond the cone bearing the antepygidial bristles, and the spiniform at the upper posterior angle of the digitoid is not knife-like. These three species agree with each other, and differ from all the others, in the shape of the manubrium of the clasper. I should much have liked to keep these three apart as *Macrostylophora*, although "macro" does not apply to the short process of *M. borneensis*. Unfortunately I have failed to find any character by which the ♀♀ of them are distinguished as a group from the ♀♀ of the ♂♂ which have no antepygidial process and which therefore are not "stylophores." One of the species, perfectly distinct, *M. probatus* J. & R. 1922, is known from the ♀ only; its ♂ may be a stylophore or a non-stylophore. What can we do with this species? Put it into cold storage until its ♂ has become known? It is the old question of basing a classification on one sex only. If ancestral characteristics, and therefore of primary value, are the basis of classification, the results may be correct, but if secondary characteristics are employed we may be led astray. The aim of systematics is twofold: (1) to group the species according to blood-relationship, with which postulate the author of *Macrostylophora* has complied; and (2) to bring the mass of forms into such order by means of definite diagnoses as finger-posts that we can find out to which squad, company or regiment each individual belongs, with which postulate the erection of genera on secondary ♂-characters only does not comply. The species with and without antepygidial ♂-process here united are undoubtedly all closely related; there is no difficulty at all in recognizing the homology of the somatics in which each species differs from the others. *Macrostylophora* is an awkward name for this assemblage of species; but we should look upon names in Nomenclature as mere symbols and discard their philological meaning, as we do in the case of Baker, Smith and Taylor, who may be bankers, lawyers or scientists and not what the name implies. A name in Nomenclature is a short symbol in place of the diagnosis, and we still labour under the illogical idea that a name must therefore be diagnostic. Fabricius, 150 years ago, saw the mistake and was quite emphatic: nomina "optima sunt, quae omnino nil significant. Characterem essentialem generis generico nomine indicare impossibile" (*Ent. Syst.* 1792, p. x). Let us then at least forget the literal meaning of the Greek word macrostylophoros, as the Rules do not allow us to discard the generic term derived from it.

A general description of the genus absolves us from repeating in the descriptions of the new species characters which are found in all.

♂♀. Frons with a small external, usually sharp, tubercle below middle; in front of row of 3 long eye-bristles a short row of a few small ones from antennal groove near to level of upper eye-bristle. Above antennal groove a long median bristle accompanied by a small one. Proboscis reaching to end of forecoxa or to middle of trochanter, not beyond. Pronotal comb of 18 spines (17-19). Abdominal terga with two rows of bristles, anterior row more or less incomplete, one or two occasional dorsal additional small bristles; I to IV or V with apical spines. Sterna III to VI with 2 or 3 bristles each side, on VII one or two more

in ♀. Mid- and hindcoxae without bristles on inner surface ; on outer side of forefemur 2 to 6 small bristles, on inner surface one ; on mid- and hindfemora one or two lateral subventral ones on outside in anterior half and none on inner side (apart from the subapical ventral bristle). Hindtarsi long, I at least as long as II and III together. Marginal stigma-cavity of tergum VIII short.

♂. Bristles of antennal segment II short. One long antepygidial bristle accompanied by two minute ones. In some species a strongly chitinized narrow process in between the two sets of antepygidial bristles. Tergum VIII large, with a row of long bristles along upper half of posterior margin, ventrally one to three long lateral bristles ; on inner surface a narrow dorsal spiculose area. Sternum VIII narrow, with a very narrow basal dorsad extension ; at apex a long bristle each side and a long membranous flap divided into numerous filaments. Tergum IX with large forward extension, acting as a manubrium. Vertical diameter of clasper much longer than horizontal one, the clasper ventricose ; two long acetabular bristles above the ventral margin of the digitoid ; manubrium of clasper broad at base, the sinus between it and the internal extension of tergum IX very narrow, usually a mere slit. Process P of clasper narrow, several times as long as broad, its apex angulate posteriorly. Digitoid large, posteriorly at or below apex with a bristle of varying size, usually modified and above lower posterior angle several more or less spiniform. Vertical arm of sternum IX distinctive : approximately its upper half elongate-triangular and pointing upwards. Anal sternum long and narrow, with long slender bristles at dorsal margin and apex.

♀. Bristles of segment II of antenna not reaching to apex of club. Interspace between long ventral bristle of posterior row of oeciput and second bristle twice that between second and third. Upper antepygidial bristle about $\frac{1}{3}$ to $\frac{1}{2}$ the length of middle one, lower one $\frac{2}{3}$ to $\frac{1}{2}$. Tergum VIII with few bristles ; ventral apical angle projecting, bearing 3 slender marginal bristles, one of them at apex of angle, the two others above it ; on inner surface one short bristle below the row and 2 or 3 farther forward. On stylet one ventral lateral bristle and dorsally a very minute one close to long apical bristle. Body of spermatheca longer than broad, barrel-shaped, with underside concave behind middle ; its duct much wider than the blind duct, less distinct in a cleared specimen, both barely longer than the duct of the bursa copulatrix ; this latter duct with a hump anteriorly above middle.

Species in our collection : *hastatus* J. & R. 1921, Shan States, Sikkim and Tonkin, 3 subspecies ; *pilatus* J. & R. 1922, South Annam ; *probatus* J. & R. 1922, South Annam ; *euteles* J. & R. 1911, West China and Yunnan ; *lupatus* J. & R. 1921, Sikkim ; *imbriatus* J. & R. 1921, N.W. India ; *phillipsi* Jord. 1925, Ceylon ; *levis* J. & R. 1921, Selangor ; *borneensis* Jord. 1926, North Borneo. And the new species and subspecies described below.

3. *Macrostylophora hastatus hastatus* Jord. & Roths. 1921.

♂. *Ceratophyllus hastatus* Jordan & Roths., Ectoparasites I, p. 168, no. 3, text-figs. 153, 154 (1921) (Shan States).

The 5 ♂♂ obtained by Dr. Heinrich have a somewhat intermediate position between our 2 Sikkimese ♂♂ and the unique type from the Shan States. The digitoid is as narrow as in *sikkimensis* ; but its ventral margin is less incurved (this margin is obscured in type of *hastatus*) ; the antepygidial process is a trifle

longer than in *sikkimensis*, the proportional length being in Tonkin (see below) 37, Shan States 32, Heinrich collection 34-36, Sikkim 29.

In the ♀♀ from Burma the apex of sternum VII is narrower than in *sikkimensis*, the sinus smaller and the lobe above it shorter.

It is advisable to wait for material from the Shan States before attempting to solve this problem of geographical variation. The characters mentioned may be quite unstable in a long series of specimens.

Maymyo, 800 m., on *Paradoxurus hermaphroditus*, 6.xii, 1 ♀, and on *Tomeutes*, 15.xii.37, 2 ♂♂; Mt. Popa, 600 m., on *Tomeutes*, 11.v.37, 1 ♂, 2 ♀♀, and at 1100 m. on *Sciurus*, 2 ♂♂.

I take this opportunity to describe a subspecies from Tonkin :

***Macrostylophora hastatus tonkinensis* subsp. nov. (text-figs. 287, 288).**

The ♂ differs from *M. h. hastatus* and *M. h. sikkimensis* in the digitoid F being broader and its upper posterior angle drawn out into a nose; manubrium narrower; antepyggidial median process a little longer than in the other sub-species. Sternum VII of ♀ as in *M. h. sikkimensis*.

Tonkin: Boa-Ha, on *Tamiops*, 30.xi.23, 1 ♂, 1 ♀ (H. Stevens), Percy Sladen-Godman Expedition.

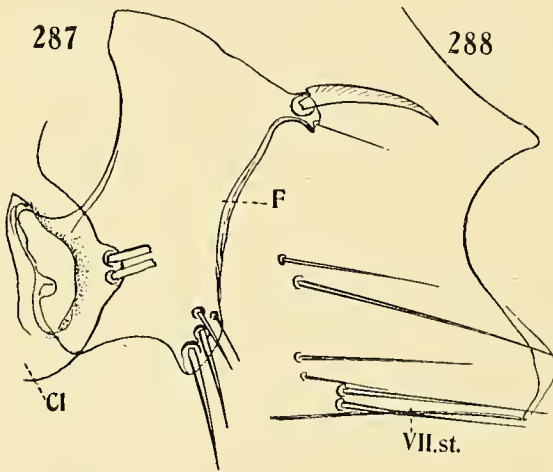
Approaching *M. pilatus* a little in the nose of the digitoid.

4. *Macrostylophora heinrichi* sp. nov. (text-figs. 289-291).

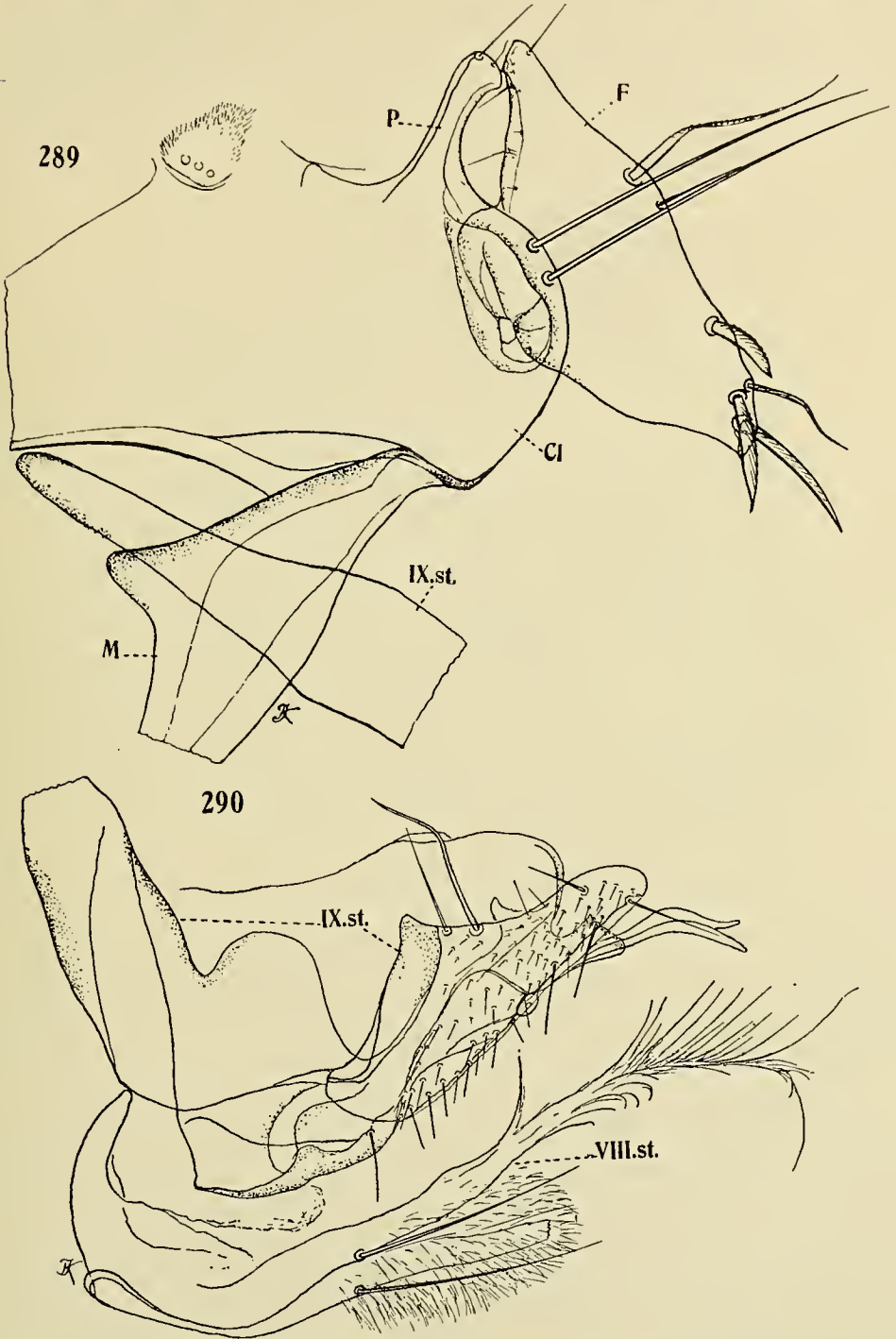
Near *M. fimbriatus* J. & R. 1921 and *M. lupatus* J. & R. 1921, differing in the tail-ends

of both sexes and apparently in nothing else.

♂. At upper margin of tergum VIII 6 long strong bristles, followed farther down by a submarginal one, nearly on a level with the latter another large bristle farther forward; on upper half of side about 8 smaller bristles, on lower area 2 large ones, one above the other. Sternum VIII (text-fig. 290) as in *M. lupatus*, the fringed flap perhaps somewhat different, evidently variable individually, and of course assuming various unnatural positions in the process of mounting the specimens. Forward extension of IX.t. and manubrium of clasper as in *M. lupatus*. Process P of clasper longer, the distance of its tip from the upper acetabular bristle longer; the two acetabulars farther apart. Digitoid F much longer in a dorso-ventral sense, this vertical diameter being about three times as long as the horizontal diameter measured from the acetabular margin of clasper; apical portion of F narrower than in *M. lupatus*, the twisted large bristle farther from upper angle, the 3 spiniforms of lower area larger than in *M. lupatus*, and the slender bristle between them curved down, not straight (simply curved, or recurved at apex as in figure). Ventral arm of sternum IX (text-fig. 290) very distinctive: the postmedian dorsal projection more prominent and the longish bristle placed at its distal side less modified than in *M. lupatus*, resembling an



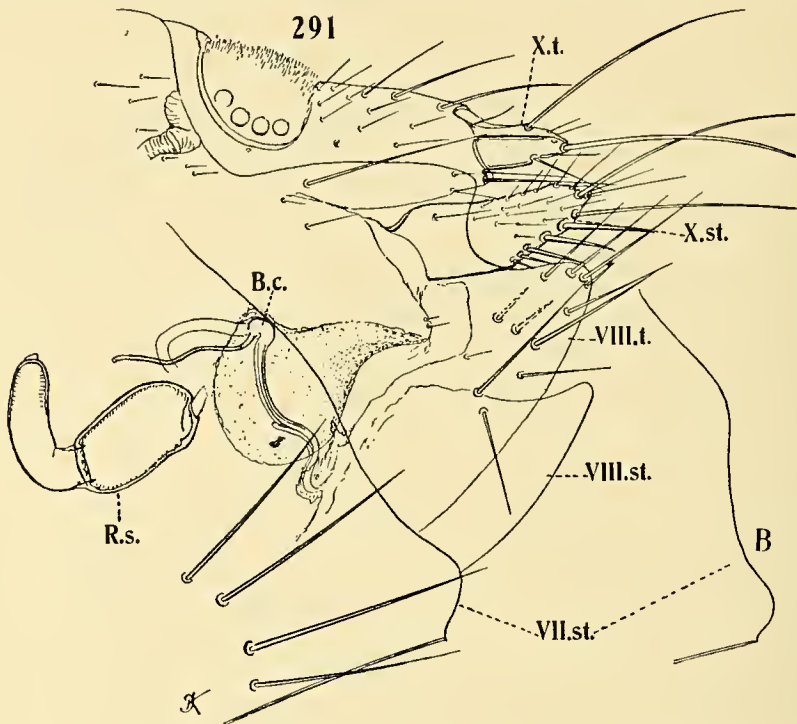
ordinary bristle, not being broad, not spiniform, and not abruptly narrowed to a point, but as in *M. lupatus* the apex of this bristle rough with minute teeth ;



the apical lobe of the segment much narrower and longer than in *M. lupatus* and with the minute bristles on its lateral surface less close together ; the dorsal hump between the vertical and ventral arms much larger. Lamina of phallosome

broader (Lam), the ventral apical processes (Par) long and slender, whereas in *M. lupatus* this process is broad, barely twice as long as broad, apically slightly dilated and rounded.

♀. Apical margin of sternum VII (text-fig. 291) more or less strongly slanting, slightly incurved and ventrally excurved, a short rounded lobe being formed, the outline varying as shown in the figure. Apical margin of widened lower area of tergum VIII much more deeply incurved than in any of the allied species, both the upper and lower lobe varying individually, being usually more pointed



than in the specimen figured. Sternum IX (internal) partially sclerified; this chitinized area broadly rounded anteriorly and narrowing to a point posteriorly the ventral margin concave and well defined; this sclerification not present in other species of the genus. Bristles of segments VIII, IX and X, as well as the spermatheca and the bursa copulatrix as in *M. lupatus*.

Length: ♂ 2.5–2.9, ♀ 2.6–3.0 mm.; hindfemur: ♂♀ 0.45–0.51 mm.

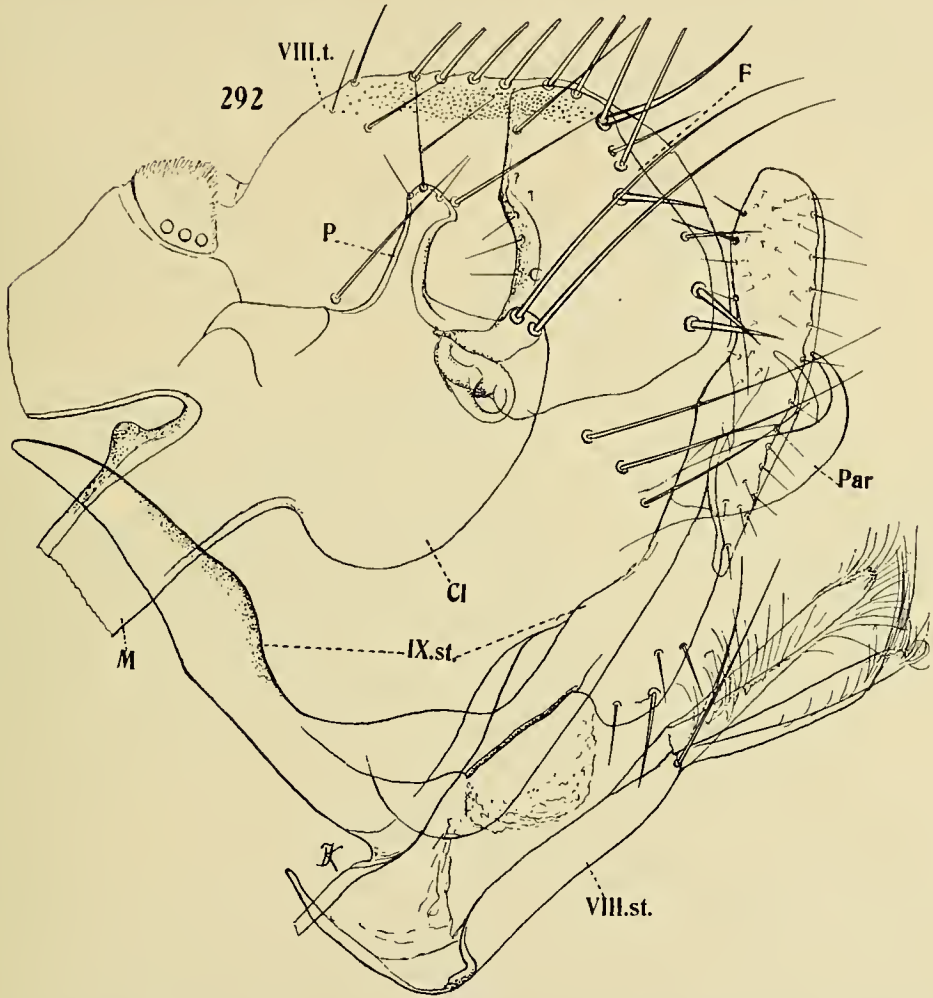
Mt. Victoria, on *Tamiops*, 13.iii.38, type ♂, on *Tomeutes*, 16. and 18.v and 16.vi.38; a small series of both sexes.

5. *Macrostylophora uncinialis* sp. nov. (text-figs. 292, 293).

Both sexes are unexpectedly found to differ from the other species in the striation of the basal abdominal sternite. In all species of the genus except this new one the striae in the posterior half of the segment are very close together, there being in the centre from base to posterior margin more than 50 vertical striae; in the new species there are about 30, the interspaces between the posterior striae being here about half as wide as the interspaces between the anterior

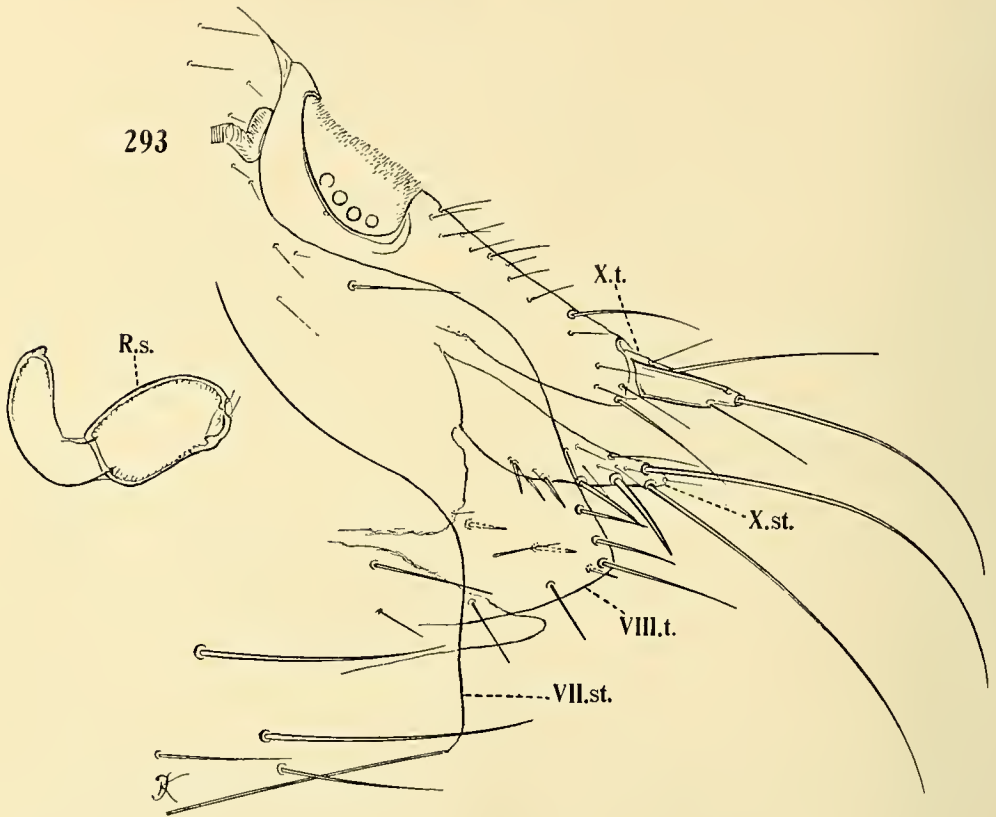
striae, in the other species very much narrower. Chaetotaxy as in other species, apart from the modified segments.

♂. Tergum VIII (text-fig. 292) dorsally with 9 long marginal bristles, the row being preceded by a small bristle, below which there is a still smaller one ; on side 6 bristles and ventrally a vertical row of 3 ; on inner side a narrow dorso-marginal spiculose area. Basal curved-up portion of sternum VIII much



narrower than in the allied species, the ventral arm longer and straighter, the apical flap with shorter filaments and not so much split up ; at the joint where the pair of bristles are placed (one each side) no additional densely filamentose flap as in *M. lupatus* J. & R. 1921 and others. Forward extension of tergum IX shorter than in *M. lupatus* and *M. heinrichi* sp. nov. The bay between this sclerite and the manubrium (M) of the clasper narrow, its apex rounded. Dorsal hump of manubrium M nearer base than in the allied species, apex of manubrium rounded. Body of clasper (Cl) rounded from acetabular bristles ventrally to manubrium, strongly near the latter, distance of base of manubrium to acetabular bristles much larger than in *M. heinrichi*, equalling $\frac{5}{9}$ of the length of M in *M. uncinatis* and $\frac{5}{12}$ in *M. heinrichi* ; process P reaching to middle of anterior

margin of digitoid F, apex more dilated than in *M. heinrichi*; acetabulars on a short broad projection of the margin of clasper. Digitoid F irregularly triangular, its dorso-ventral length (measured parallel with posterior margin) not quite twice the width measured from acetabular margin parallel with ventral margin; angle of anterior margin in middle, margin straight from this angle to apical angle; ventral margin slightly concave proximally and distally and feebly convex in between; posterior ventral angle strongly rounded; upper (anterior) angle about 90° ; dorsal margin from this angle to large marginal bristle (about $\frac{2}{9}$ of total margin from anterior apical angle to posterior ventral one) rounded, then



the margin slightly concave to the smaller marginal bristle, and the rest convex; 4 large spiniforms and 2 smaller bristles, the largest at $\frac{2}{9}$, about as long as F is broad in middle, the second smaller, a short distance below the large one, the third above middle away from margin, large, the fourth again small, placed at beginning of lower convexity of margin, the following 2 placed one above the other near ventral margin and both as large as the third from above; none of these bristles as stout as the large spiniforms of *M. lupatus*, *M. heinrichi*, *M. phillipsi*, etc., resembling more those of *M. levis* J. & R. 1922. Upper half of vertical arm of sternum IX slightly leaning forward; in angle between vertical and ventral arms the segment widened, but there is no such prominent hump as in *M. heinrichi* (compare text-figs. 285 and 292); proximal non-setose section of ventral arm a little shorter than setose distal portion, abruptly widened ventrad before middle, the angle rounded off, beyond it a few bristles; distal setose section of

nearly the same width throughout, dorsally incurved in middle and apically rounded, the proximal dorsal prominence of *M. heinrichi* and others absent, as is also the long bristle placed in the other species at the distal side of this dorsal hump. Ventral process of parameres a large hook curved upwards (Par).

♀. Sternum VII (text-fig. 293) truncate, feebly incurved or slightly rounded. Apical margin of widened apical area of tergum VIII hardly at all incurved, the ventral angle less than 90° , its tip rounded off, upper angle almost effaced, replaced by a flat arc. Distance of sensillum from stylet longer than in the allied species, measured dorsally almost twice the length of the sensillum (6 or 7 : 11, in *M. heinrichi* 6 : 8); sternum X also longer and narrower. Spermatheca a little more convex dorsally than in the allied species.

Length : ♂ 2.4, ♀ 3.0–3.6 mm.; hind-femur : ♂ 0.43, ♀ 0.45–0.48 mm.

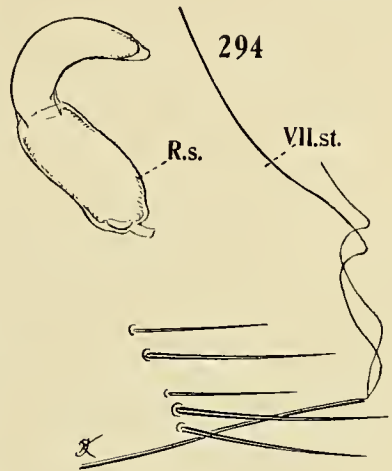
Mt. Victoria, 2600 m., on *Tomeutes*, 6 and 12.v.28, 1 ♂ (type), 3 ♀♀; also on *Rattus*, 27.iv.38, 1 ♀.

6. *Macrostylophora lupatus bamanus* subsp. nov. (text-fig. 294).

♀. A little smaller than *M. l. lupatus* from Sikkim (length of hindfemur in *lupatus* 59 to 66, in *bamanus* 52 (one specimen !)). Body of spermatheca narrower and in comparison with the width longer, being slightly over twice as long as broad, whereas in *M. l. lupatus* it is at most twice as long as broad. Sinus of sternum VII broader.

Length : ♀ 2.5 mm.; hindfemur : ♀ 0.39 mm.

Maymyo, 800 m., on *Funambulius*, 6.xii.37, 1 ♀.



7. *Stivalius aporus* J. & R. 1922.

Maymyo, 800 m., on *Tomeutes*, 15.xii.37, 1 ♀; forest north of Prome, 24.ix.37, on "Rat," 1 ♂; Dudaw-Toung, Pakokku Chin Hills, on *Tupaya*, 11.ii.38, 2 ♂♂, 2 ♀♀; Mt. Victoria, 2200 m., on "Rat," 19.vi.38, 1 ♀.

The species is known to us only from South India and Ceylon (and Zululand, an accidental occurrence). The Burmese specimens do not seem to differ at all. This may be one of the species, known in other groups of insects, which link the fauna of Ceylon with that of Burma independently of North India.

8. *Neopsylla dispar* Jord. 1932 (text-fig. 295).

Mt. Victoria, 2600 m., on "Tree Rat," 4 ♂♂, 3 ♀♀.

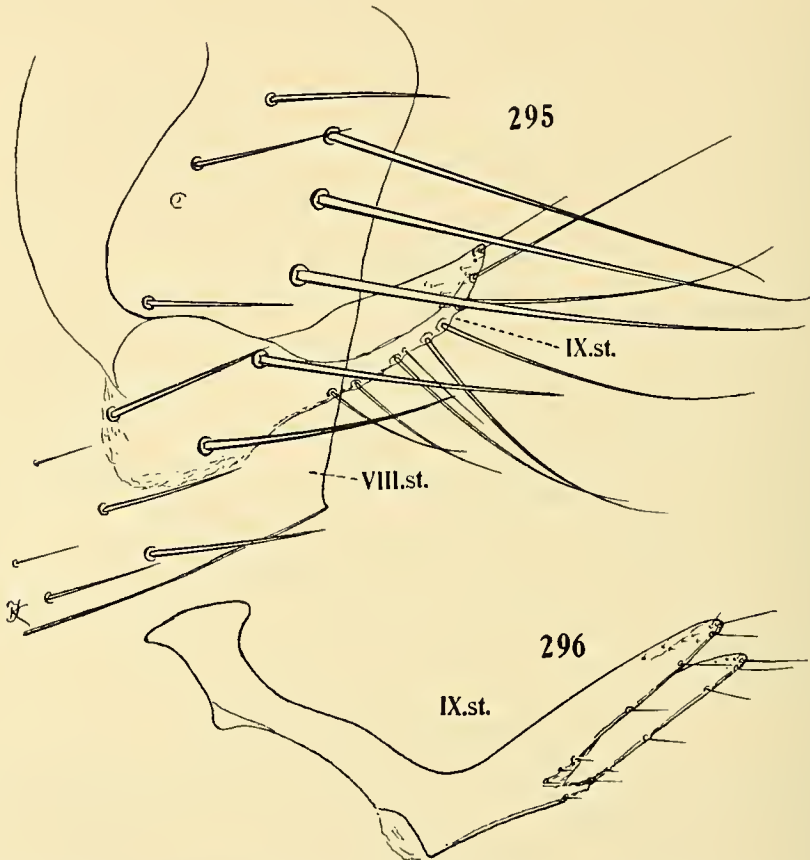
Described from a pair obtained in North-East Burma on *Epimys*. The ventral arm of sternum IX is slightly broader in these ♂♂ than in the type. Besides, the ventral margin is distinctly rounded-angulate in the type, whereas there is hardly an indication of the angle in Dr. Heinrich's ♂♂; the gap in the row of bristles of the type is present in one of the specimens and less distinctly

in the others. In our figure of the spermatheca (Nov. Zool. xxxviii, p. 272) the body is a little too broad and the tail apically slightly too wide.

9. *Palaeopsylla remota* Jord. 1929 (text-fig. 296).

Mt. Victoria, 1400 m., on *Anurosorex*, 22.iii.38, a small series of both sexes.

Described from a single ♀ collected at Chungking, Upper Yangtse-kiang. H. Stevens obtained in 1931 a series in Sikkim on *Anurosorex assamensis*. The



genitalia of the ♂ resemble those of *P. sorecis* Dale 1878 in the digitoid being long; in *remota*, however, it is straight and projects beyond the apex of the clasper. Sternum IX quite different, its ventral arm long and almost gradually narrowed to a point, with a few slender bristles.

10. *Thaumapsylla breviceps* Roths. 1907.

Lamaing, 30 km. north of Mandalay, 14.i.38, on *Rousettus*, 1 ♂.—The usual number of spines on the inner side of the mesonotum is two each side; this specimen has two on one side and three on the other. We have in the collection also specimens with three each side, a ♂ from Java and a ♀ from the Cape, together with specimens which have the normal number.

EXPLANATION OF TEXT-FIGURES

The lettering is explained in the text.

Fig. 284.	<i>Peraceras hamatus</i>, ♀	. . . . .	p. 362
285.	„ „ genitalia of ♂	. . . . .	p. 363
286.	„ „ „ „ ♀	. . . . .	p. 365
287.	<i>Macrostylophora hastatus tonkinensis</i> , digitoid of ♂	. . . . .	p. 368
288.	„ „ „ sternum VII of ♀	. . . . .	p. 368
289.	„ <i>heinrichi</i> , genitalia of ♂, upper sclerites	. . . . .	p. 369
290.	„ „ „ „ ♂, lower sclerites	. . . . .	p. 369
291.	„ „ „ „ ♀	. . . . .	p. 370
292.	„ <i>uncinalis</i>, „ „ ♂	. . . . .	p. 371
293.	„ „ „ „ ♀	. . . . .	p. 372
294.	„ <i>lupatus bamanus</i> , ♀, sternum VII and spermatheca	. . . . .	p. 373
295.	<i>Neopsylla dispar</i> , ♂, sterna VIII and IX	. . . . .	p. 374
296.	<i>Palaeopsylla remota</i> , ♂, sternum IX	. . . . .	p. 374

